SEQUENCE LISTING

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Rossomando, Anthony
Johansen, Teit E.

<120> NOVEL NEUROTROPHIC FACTORS

<130> 13751-056001

<140> US 10/661,984
<141> 2003-09-12

<150> US 09/804,615
<151> 2001-03-12

<150> PCT/EP02/02691
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tccccaagcc cacctgggtg ccctctttct ccctgaggct ccacttggtc tctccgcgc 119
atg cct gcc ctg tgg ccc acc ctg gcc gct ctg gct ctg ctg agc agc 167
Met Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu Ala Leu Leu Ser Ser
-20 -15 -10 -5

gtc gca gag gcc tcc ctg ggc tcc gcg ccc cgc agc cct gcc ccc cgc 215
Val Ala Glu Ala Ser Leu Gly Ser Ala Pro Arg Ser Pro Ala Pro Arg
1 5 10

gaa ggc ccc ccg cct gtc ctg gcg tcc ccc gcc ggc cac ctg ccg ggg 263

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Glu Gly Pro Pro Pro Val Leu Ala Ser Pro Ala Gly His Leu Pro Gly
          15                  20                  25

gga cgc acg gcc cgc tgg tgc agt gga aga gcc cgg cgg ccg cgc cgc      311
Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg Ala Arg Arg Pro Arg Arg
     30                  35                  40

aga cac ttc tcg gcc cgc gcc ccc gcc gcc tgc acc ccc atc tgc tct      359
Arg His Phe Ser Ala Arg Ala Pro Ala Ala Cys Thr Pro Ile Cys Ser
 45                  50                  55                  60

tcc ccg cgg gtc cgc gcg gcg cgg ctg ggg ggc cgg gca gcg cgc tcg      407
Ser Pro Arg Val Arg Ala Ala Arg Leu Gly Gly Arg Ala Ala Arg Ser
                 65                  70                  75

ggc agc ggg ggc gcg ggg tgc cgc ctg cgc tcg cag ctg gtg ccg gtg      455
Gly Ser Gly Gly Ala Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val
             80                  85                  90

cgc gcg ctc ggc ctg ggc cac cgc tcc gac gag ctg gtg cgt ttc cgc      503
Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg
         95                  100                 105

ttc tgc acc ggc tcc tgc ccg cgc gcg cgc tct cca cac gac ctc agc      551
Phe Cys Thr Gly Ser Cys Pro Arg Ala Arg Ser Pro His Asp Leu Ser
    110                 115                 120

ctg gcc agc cta ctg ggc gcc ggg gcc ctg cga ccg ccc ccg ggc tcc      599
Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser
125                 130                 135                 140

cgg ccc gtc agc cag ccc tgc tgc cga ccc acg cgc tac gaa gcg gtc      647
Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val
                145                 150                 155

tcc ttc atg gac gtc aac agc acc tgg aga acc gtg gac cgc ctc tcc      695
Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser
            160                 165                 170

gcc acc gcc tgc ggc tgc ctg ggc tgagggctcg ctccagggct ttgcagactg     749
Ala Thr Ala Cys Gly Cys Leu Gly
        175                 180

gacccttacc ggtggctctt cctgcctggg accctcccgc agagtcccac tagccagcgg    809
cctcagccag ggacgaaggc ctcaaagctg agaggcccct gccggtgggt gatgga        865

<210> 2
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<213> Homo sapiens

<220>
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<400> 2
Met Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu Ala Leu Leu Ser Ser
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Val Ala Glu Ala Ser Leu Gly Ser Ala Pro Arg Ser Pro Ala Pro Arg
                 1                   5                  10
Glu Gly Pro Pro Pro Val Leu Ala Ser Pro Ala Gly His Leu Pro Gly
        15                  20                  25
Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg Ala Arg Arg Pro Arg Arg
    30                  35                  40
Arg His Phe Ser Ala Arg Ala Pro Ala Ala Cys Thr Pro Ile Cys Ser
45                  50                  55                  60
Ser Pro Arg Val Arg Ala Ala Arg Leu Gly Gly Arg Ala Ala Arg Ser
                65                  70                  75
Gly Ser Gly Gly Ala Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val
            80                  85                  90
Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg
        95                  100                 105
Phe Cys Thr Gly Ser Cys Pro Arg Ala Arg Ser Pro His Asp Leu Ser
    110                 115                 120
Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser
125                 130                 135                 140
Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val
                145                 150                 155
Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser
            160                 165                 170
Ala Thr Ala Cys Gly Cys Leu Gly
        175                 180
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       Met Pro Gly Leu Ile Ser Ala Arg Gly Gln Pro Leu Leu Glu
           -55                 -50                 -45
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gtc ctt cct ccc caa gcc cac ctg ggt gcc ctc ttt ctc cct gag gct        96
Val Leu Pro Pro Gln Ala His Leu Gly Ala Leu Phe Leu Pro Glu Ala
        -40                 -35                 -30

cca ctt ggt ctc tcc gcg cag cct gcc ctg tgg ccc acc ctg gcc gct       144
Pro Leu Gly Leu Ser Ala Gln Pro Ala Leu Trp Pro Thr Leu Ala Ala
    -25                 -20                 -15

ctg gct ctg ctg agc agc gtc gca gag gcc tcc ctg ggc tcc gcg ccc       192
Leu Ala Leu Leu Ser Ser Val Ala Glu Ala Ser Leu Gly Ser Ala Pro
-10                 -5                  1                   5

cgc agc cct gcc ccc cgc gaa ggc ccc ccg cct gtc ctg gcg tcc ccc       240
Arg Ser Pro Ala Pro Arg Glu Gly Pro Pro Pro Val Leu Ala Ser Pro
            10                  15                  20

gcc ggc cac ctg ccg ggg gga cgc acg gcc cgc tgg tgc agt gga aga       288
Ala Gly His Leu Pro Gly Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg
        25                  30                  35

gcc cgg cgg ccg ccg ccg cag cct tct cgg ccc gcg ccc ccg ccg cct       336
Ala Arg Arg Pro Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Pro
    40                  45                  50

gca ccc cca tct gct ctt ccc cgc ggg ggc cgc gcg gcg cgg gct ggg       384
Ala Pro Pro Ser Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly
55                  60                  65                  70

ggc ccg ggc aac cgc gct cgg gca gcg ggg gcg cgg ggc tgc cgc ctg       432
Gly Pro Gly Asn Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu
                75                  80                  85

cgc tcg cag ctg gtg ccg gtg cgc gcg ctc ggc ctg ggc cac cgc tcc       480
Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser
            90                  95                  100

gac gag ctg gtg cgt ttc cgc ttc tgc agc ggc tcc tgc cgc cgc gcg       528
Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala
        105                 110                 115

cgc tct cca cac gac ctc agc ctg gcc agc cta ctg ggc gcc ggg gcc       576
Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala
    120                 125                 130

ctg cga ccg ccc ccg ggc tcc cgg ccc gtc agc cag ccc tgc tgc cga       624
Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg
135                 140                 145                 150

ccc acg cgc tac gaa gcg gtc tcc ttc atg gac gtc aac agc acc tgg       672
Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp
                155                 160                 165

aga acc gtg gac cgc ctc tcc gcc aac ccc tgc ggc tgc ctg ggc           717
Arg Thr Val Asp Arg Leu Ser Ala Asn Pro Cys Gly Cys Leu Gly
            170                 175                 180
```

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tgagggctcg ctccagggct ttgcagactg gacccttacc ggtggctctt cctgcctggg    777
accctcccgc agagtcccac tagccagcgg cctcagccag ggacgaaggc ctcaaagctg    837
agaggcccct gccggtgggt gatg                                          861

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<212> PRT
<213> Homo sapiens

<220>
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<222> (1)...(56)

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Pro Pro Gln Ala His Leu Gly Ala Leu Phe Leu Pro Glu Ala Pro Leu
-40                 -35                 -30                 -25
Gly Leu Ser Ala Gln Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu Ala
                -20                 -15                 -10
Leu Leu Ser Ser Val Ala Glu Ala Ser Leu Gly Ser Ala Pro Arg Ser
            -5                  1                   5
Pro Ala Pro Arg Glu Gly Pro Pro Pro Val Leu Ala Ser Pro Ala Gly
    10                  15                  20
His Leu Pro Gly Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg Ala Arg
25                  30                  35                  40
Arg Pro Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Pro Ala Pro
                45                  50                  55
Pro Ser Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly Gly Pro
            60                  65                  70
Gly Asn Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser
        75                  80                  85
Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu
    90                  95                  100
Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser
105                 110                 115                 120
Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg
                125                 130                 135
Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr
            140                 145                 150
Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr
        155                 160                 165
Val Asp Arg Leu Ser Ala Asn Pro Cys Gly Cys Leu Gly
    170                 175                 180

<210> 5
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<213> Homo sapiens

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<223> Xaa = Asn or Thr

<221> VARIANT
<222> 135
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<223> Xaa = Ala or Pro

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Pro Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Pro Ala Pro Pro
1 5 10 15
Ser Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly Gly Pro Gly
20 25 30
Asn Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln
35 40 45
Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu
50 55 60
Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro
65 70 75 80
His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro
85 90 95
Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg
100 105 110
Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val
115 120 125
Asp Arg Leu Ser Ala Xaa Xaa Cys Gly Cys Leu Gly
130 135 140

<210> 6
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<212> PRT
<213> Homo sapiens

<220>
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<222> 110
<223> Xaa = Asn or Thr

<221> VARIANT
<222> 111
<223> Xaa = Ala or Pro

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Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly
20 25 30
Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly
35 40 45
Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu
50 55 60
Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser
65 70 75 80
Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp
85 90 95
Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Xaa Xaa Cys
100 105 110
Gly Cys Leu Gly
115

<210> 7
<211> 113
<212> PRT

<213> Homo sapiens

<220>
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<222> 107
<223> Xaa = Asn or Thr

<221> VARIANT
<222> 108
<223> Xaa = Ala or Pro

<400> 7

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Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His
            20                  25                  30
Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg
        35                  40                  45
Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala
    50                  55                  60
Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys
65                  70                  75                  80
Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser
                85                  90                  95
Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Xaa Xaa Cys Gly Cys Leu
            100                 105                 110
Gly
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<210> 8
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<213> Homo sapiens

<220>
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<221> 3'UTR
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<222> (379)...(717)

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aggagggtgg gggaacagct caacaatggc tgatgggcgc tcctggtgtt gatagag atg      60
                                                                  Met

gaa ctt gga ctt gga ggc ctc tcc acg ctg tcc cac tgc ccc tgg cct      108
Glu Leu Gly Leu Gly Gly Leu Ser Thr Leu Ser His Cys Pro Trp Pro
            -35                 -30                 -25

agg cgg cag cct gcc ctg tgg ccc acc ctg gcc gct ctg gct ctg ctg      156
Arg Arg Gln Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu Ala Leu Leu
        -20                 -15                 -10

agc agc gtc gca gag gcc tcc ctg ggc tcc gcg ccc cgc agc cct gcc      204
Ser Ser Val Ala Glu Ala Ser Leu Gly Ser Ala Pro Arg Ser Pro Ala
     -5 '               1               5                  10

ccc cgc gaa ggc ccc ccg cct gtc ctg gcg tcc ccc gcc ggc cac ctg      252
Pro Arg Glu Gly Pro Pro Pro Val Leu Ala Ser Pro Ala Gly His Leu
                15                  20                  25

ccg ggg gga cgc acg gcc cgc tgg tgc agt gga aga gcc cgg cgg ccg      300
Pro Gly Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg Ala Arg Arg Pro
            30                  35                  40

ccg ccg cag cct tct cgg ccc gcg ccc ccg ccg cct gca ccc cca tct      348
Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Pro Ala Pro Pro Ser
         45                  50                  55

gct ctt ccc cgc ggg ggc cgc gcg gcg cgg gct ggg ggc ccg ggc agc      396
Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly Gly Pro Gly Ser
     60                  65                  70

cgc gct cgg gca gcg ggg gcg cgg ggc tgc cgc ctg cgc tcg cag ctg      444
Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu
 75                  80                  85                  90

gtg ccg gtg cgc gcg ctc ggc ctg ggc cac cgc tcc gac gag ctg gtg      492
Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val
                95                  100                 105

cgt ttc cgc ttc tgc agc ggc tcc tgc cgc cgc gcg cgc tct cca cac      540
Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His
            110                 115                 120

gac ctc agc ctg gcc agc cta ctg ggc gcc ggg gcc ctg cga ccg ccc      588
Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro
        125                 130                 135

ccg ggc tcc cgg ccc gtc agc cag ccc tgc tgc cga ccc acg cgc tac      636
Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr
    140                 145                 150

gaa gcg gtc tcc ttc atg gac gtc aac agc acc tgg aga acc gtg gac      684
Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp
155                 160                 165                 170

cgc ctc tcc gcc acc gcc tgc ggc tgc ctg ggc tgagggctcg ctccagggct    737
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Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
                175                 180

ttgcagactg gacccttacc ggtggctctt cctgcctggg accctcccgc agagtcccac    797
tagccagcgg cctcagccag ggacgaaggc ctcaaagctg agaggcccct accggtgggt    857
gatg                                                                 861

<210> 9
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<212> PRT
<213> Homo sapiens

<220>
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<222> (1)...(39)

<221> MOD_RES
<222> 163
<223> glycosylated asparagine residue

<400> 9
Met Glu Leu Gly Leu Gly Gly Leu Ser Thr Leu Ser His Cys Pro Trp
                -35                 -30                 -25
Pro Arg Arg Gln Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu Ala Leu
            -20                 -15                 -10
Leu Ser Ser Val Ala Glu Ala Ser Leu Gly Ser Ala Pro Arg Ser Pro
        -5                  1                   5
Ala Pro Arg Glu Gly Pro Pro Pro Val Leu Ala Ser Pro Ala Gly His
10                  15                  20                  25
Leu Pro Gly Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg Ala Arg Arg
                30                  35                  40
Pro Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Pro Ala Pro Pro
            45                  50                  55
Ser Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly Gly Pro Gly
        60                  65                  70
Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln
    75                  80                  85
Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu
90                  95                  100                 105
Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro
                110                 115                 120
His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro
            125                 130                 135
Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg
        140                 145                 150
Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val
    155                 160                 165
Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
170                 175                 180

<210> 10
<211> 140
<212> PRT
<213> Homo sapiens

<220>
<221> MOD_RES
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<222> 122
<223> glycosylated asparagine residue

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 1   5   10   15
Ser Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly Gly Pro Gly
            20   25   30
Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln
        35   40   45
Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu
    50   55   60
Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro
65   70   75   80
His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro
                85   90   95
Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg
            100   105   110
Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val
        115   120   125
Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
    130   135   140

<210> 11
<211> 116
<212> PRT
<213> Homo sapiens

<220>
<221> MOD_RES
<222> 98
<223> glycosylated asparagine residue

<400> 11
Ala Ala Arg Ala Gly Gly Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala
 1   5   10   15
Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly
            20   25   30
Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly
        35   40   45
Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu
    50   55   60
Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser
65   70   75   80
Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp
                85   90   95
Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys
            100   105   110
Gly Cys Leu Gly
        115

<210> 12
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<212> PRT
<213> Homo sapiens

<220>

<221> MOD_RES
<222> 95
<223> glycosylated asparagine residue

<400> 12
Ala Gly Gly Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys
 1   5   10   15
Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His
            20   25   30
Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg
        35   40   45
Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala
    50   55   60
Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys
65   70   75   80
Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser
                85   90   95
Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu
            100   105   110
Gly

<210> 13
<211> 102
<212> DNA
<213> Homo sapiens

<400> 13
cctggccagc ctactgggcg ccggggccct gcgaccgccc ccgggctccc ggcccgtcag 60
ccagccctgc tgccgaccca cgcgctacga agcggtctcc tt   102

<210> 14
<211> 220
<212> DNA
<213> Mus musculus

<400> 14
ggccaccgct ccgacgagct gatacgtttc cgcttctgca gcggctcgtg ccgccgagca 60
cgctcccagc acgatctcag tctggccagc ctactgggcg ctggggccct acggtcgcct 120
cccgggtccc ggccgatcag ccagccctgc tgccggccca ctcgctatga ggccgtctcc 180
ttcatggacg tgaacagcac ctggagaacc gtggaccgcc   220

<210> 15
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<212> DNA
<213> Mus musculus

<220>
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<222> (975)...(1646)

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gcggccgcga attcggcacg agggcgtctc gctgcagccc gcgatctcta ctctgcctcc 60
tggggtcttc tccaaatgtc tagcccccac ctagagggac ctagcctagc cagcggggac 120
cggatccgga gggtggagcg gccaggtgag ccctgaaagg tggggcgggg cgggggcgct 180
ctgggcccca ccccgggatc tggtgacgcc ggggctggaa tttgacaccg gacggcggcg 240
ggcaggaggc tgctgaggga tggagttggg ctcggccccc agatgcggcc cgcgggctct 300

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gccagcaaca agtccctcgg gccccagccc tcgctgcgac tggggcttgg agccctgcac    360
ccaagggcac agaccggctg ccaaggcccc acttttaact aaaagaggcg ctgccaggtg    420
cacaactctg ggcatgatcc acttgagctt cgggggaaag cccagcactg gtcccaggag    480
aggcgcctag aaggacacgg accaggaccc ctttggtatg gagtgaacgc tgagcatgga    540
gtggaaggaa ctcaagttac tactttctcc aaccaccctg gtaccttcag ccctgaagta    600
cagagcagaa gggtcttaga agacaggacc acagctgtgt gagtctcccc cctgaggcct    660
tagacgatct ctgagctcag ctgagctttg tttgcccatc tggagaagtg agccattgat    720
tgaccttgtg gcatcgcgaa ggaacaggtc ctgccaagca cctaacacag agagcaaggt    780
tctccatcgc agctaccgct gctgagttga ctctagctac tccaacctcc tgggtcgctt    840
cgagagactg gagtggaagg aggaataccc caaaggataa ctaactcatc tttcagtttg    900
caagctgccg caggaagagg gtggggaaac gggtccacga aggcttctga tgggagcttc    960
tggagccgaa agct atg gaa ctg gga ctt gca gag cct act gca ttg tcc      1010
               Met Glu Leu Gly Leu Ala Glu Pro Thr Ala Leu Ser
                1               5                  10

cac tgc ctc cgg cct agg tgg cag tca gcc tgg tgg cca acc cta gct      1058
His Cys Leu Arg Pro Arg Trp Gln Ser Ala Trp Trp Pro Thr Leu Ala
        15                  20                  25

gtt cta gcc ctg ctg agc tgc gtc aca gaa gct tcc ctg gac cca atg      1106
Val Leu Ala Leu Leu Ser Cys Val Thr Glu Ala Ser Leu Asp Pro Met
    30                  35                  40

tcc cgc agc ccc gcc gct cgc gac ggt ccc tca ccg gtc ttg gcg ccc      1154
Ser Arg Ser Pro Ala Ala Arg Asp Gly Pro Ser Pro Val Leu Ala Pro
45                  50                  55                  60

ccc acg gac cac ctg cct ggg gga cac act gcg cat ttg tgc agc gaa      1202
Pro Thr Asp His Leu Pro Gly Gly His Thr Ala His Leu Cys Ser Glu
                65                  70                  75

aga acc ctg cga ccc ccg cct cag tct cct cag ccc gca ccc ccg ccg      1250
Arg Thr Leu Arg Pro Pro Pro Gln Ser Pro Gln Pro Ala Pro Pro Pro
            80                  85                  90

cct ggt ccc gcg ctc cag tct cct ccc gct gcg ctc cgc ggg gca cgc      1298
Pro Gly Pro Ala Leu Gln Ser Pro Pro Ala Ala Leu Arg Gly Ala Arg
        95                  100                 105

gcg gcg cgt gca gga acc cgg agc agc cgc gca cgg acc aca gat gcg      1346
Ala Ala Arg Ala Gly Thr Arg Ser Ser Arg Ala Arg Thr Thr Asp Ala
    110                 115                 120

cgc ggc tgc cgc ctg cgc tcg cag ctg gtg ccg gtg agc gcg ctc ggc      1394
Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Ser Ala Leu Gly
125                 130                 135                 140

cta ggc cac agc tcc gac gag ctg ata cgt ttc cgc ttc tgc agc ggc      1442
Leu Gly His Ser Ser Asp Glu Leu Ile Arg Phe Arg Phe Cys Ser Gly
                145                 150                 155

tcg tgc cgc cga gca cgc tcc cag cac gat ctc agt ctg gcc agc cta      1490
Ser Cys Arg Arg Ala Arg Ser Gln His Asp Leu Ser Leu Ala Ser Leu
            160                 165                 170

ctg ggc gct ggg gcc cta cgg tcg cct ccc ggg tcc cgg ccg atc agc      1538
Leu Gly Ala Gly Ala Leu Arg Ser Pro Pro Gly Ser Arg Pro Ile Ser
```

```
        175                 180                 185

cag ccc tgc tgc cgg ccc act cgc tat gag gcc gtc tcc ttc atg gac     1586
Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp
    190                 195                 200

gtg aac agc acc tgg agg acc gtg gac cac ctc tcc gcc act gcc tgc     1634
Val Asn Ser Thr Trp Arg Thr Val Asp His Leu Ser Ala Thr Ala Cys
205                 210                 215                 220

ggc tgt ctg ggc tgaggatgat ctatctccaa gcctttgcac actagaccca         1686
Gly Cys Leu Gly


tgtgttgccc tacctggaac agctccaccg ggcctcacta accaggagcc tcaactcagc   1746
aggatatgga ggctgcagag ctcaggcccc aggccggtga gtgacagacg tcgtcggcat   1806
gacagacaga gtgaaagatg tcggaaccac tgaccaacag tcccaagttg ttcatggatc   1866
ccagctctac agacaggaga aacctcagct aaagagaact cctctgggag aatccagaaa   1926
tggccctctg tcctggggaa tgaattttga agagatatat atacatatat acattgtagt   1986
cgcgttgctg gaccagcctg tgctgaaacc agtcccgtgt tcacttgtgg aagccgaagc   2046
cctatttatt atttctaaat tatttattta ctttgaaaaa aaacggccaa gtcggcctcc   2106
ctttagtgag ggttaatttg tgatcccggg                                   2136

<210> 16
<211> 224
<212> PRT
<213> Mus musculus

<400> 16
Met Glu Leu Gly Leu Ala Glu Pro Thr Ala Leu Ser His Cys Leu Arg
 1               5                  10                  15
Pro Arg Trp Gln Ser Ala Trp Trp Pro Thr Leu Ala Val Leu Ala Leu
            20                  25                  30
Leu Ser Cys Val Thr Glu Ala Ser Leu Asp Pro Met Ser Arg Ser Pro
        35                  40                  45
Ala Ala Arg Asp Gly Pro Ser Pro Val Leu Ala Pro Pro Thr Asp His
    50                  55                  60
Leu Pro Gly Gly His Thr Ala His Leu Cys Ser Glu Arg Thr Leu Arg
65                  70                  75                  80
Pro Pro Pro Gln Ser Pro Gln Pro Ala Pro Pro Pro Pro Gly Pro Ala
                85                  90                  95
Leu Gln Ser Pro Pro Ala Ala Leu Arg Gly Ala Arg Ala Ala Arg Ala
            100                 105                 110
Gly Thr Arg Ser Ser Arg Ala Arg Thr Thr Asp Ala Arg Gly Cys Arg
        115                 120                 125
Leu Arg Ser Gln Leu Val Pro Val Ser Ala Leu Gly Leu Gly His Ser
    130                 135                 140
Ser Asp Glu Leu Ile Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg
145                 150                 155                 160
Ala Arg Ser Gln His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly
                165                 170                 175
Ala Leu Arg Ser Pro Pro Gly Ser Arg Pro Ile Ser Gln Pro Cys Cys
            180                 185                 190
Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr
        195                 200                 205
Trp Arg Thr Val Asp His Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
    210                 215                 220
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<210> 17
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 17
cctggccagc ctactggg 18

<210> 18
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 18
aaggagaccg cttcgtagcg 20

<210> 19
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 19
atggaacttg gacttgg 17

<210> 20
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 20
tccatcaccc accggc 16

<210> 21
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 21
ggccaccgct ccgacgag 18

<210> 22

<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 22
ggcggtccac ggttctccag 20

<210> 23
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 23
ccaagcccac ctgggtgccc tctttctcc 29

<210> 24
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 24
catcacccac cggcaggggc ctctcag 27

<210> 25
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 25
gagcccatgc ccggcctgat ctcagcccga ggaca 35

<210> 26
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 26
ccctggctga ggccgctggc tagtgggact ctgc 34

<210> 27
<211> 31
<212> DNA

<213> Artificial Sequence

<220>
<223> probe

<221> misc_feature
<222> 1
<223> n = A, T, G, or C

<400> 27
ncaggtggtc cgtgggggggc gccaagaccg g 31

<210> 28
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 28
ctaggagccc atgccc 16

<210> 29
<211> 351
<212> DNA
<213> Homo sapiens

<400> 29
atggctggag gaccgggatc tcgtgctcgt gcagcaggag cacgtggctg tcgtctgcgt 60
tctcaactag tgccggtgcg tgcactcgga ctgggacacc gttccgacga actagtacgt 120
tttcgttttt gttcaggatc ttgtcgtcgt gcacgttctc cgcatgatct atctctagca 180
tctctactag gagccggagc actaagaccg ccgccgggat ctagacctgt atctcaacct 240
tgttgtagac ctactagata cgaagcagta tctttcatgg acgtaaactc tacatggaga 300
accgtagata gactatctgc aaccgcatgt ggctgtctag gatgataata g 351

<210> 30
<211> 414
<212> DNA
<213> Homo sapiens

<400> 30
atgggccatc atcatcatca tcatcatcat catcactcga gcggccatat cgacgacgac 60
gacaaggctg gaggaccggg atctcgtgct cgtgcagcag gagcacgtgg ctgtcgtctg 120
cgttctcaac tagtgccggt gcgtgcactc ggactgggac accgttccga cgaactagta 180
cgttttcgtt tttgttcagg atcttgtcgt cgtgcacgtt ctccgcatga tctatctcta 240
gcatctctac taggagccgg agcactaaga ccgccgccgg gatctagacc tgtatctcaa 300
ccttgttgta gacctactag atacgaagca gtatctttca tggacgtaaa ctctacatgg 360
agaaccgtag atagactatc tgcaaccgca tgtggctgtc taggatgata atag 414

<210> 31
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 31
aaggaaaaaa gcggccgcca tggaacttgg acttggagg 39

<210> 32
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 32
ttttttcctt ggcggccgct cagcccaggc agccgcagg 39

<210> 33
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 33
gagcgagccc tcagcc 16

<210> 34
<211> 224
<212> PRT
<213> Rattus norvegicus

<400> 34
Met Glu Leu Gly Leu Gly Glu Pro Thr Ala Leu Ser His Cys Leu Arg
1 5 10 15
Pro Arg Trp Gln Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu Ala Leu
20 25 30
Leu Ser Ser Val Thr Glu Ala Ser Leu Asp Pro Met Ser Arg Ser Pro
35 40 45
Ala Ser Arg Asp Val Pro Ser Pro Val Leu Ala Pro Pro Thr Asp Tyr
50 55 60
Leu Pro Gly Gly His Thr Ala His Leu Cys Ser Glu Arg Ala Leu Arg
65 70 75 80
Pro Pro Pro Gln Ser Pro Gln Pro Ala Pro Pro Pro Pro Gly Pro Ala
85 90 95
Leu Gln Ser Pro Pro Ala Ala Leu Arg Gly Ala Arg Ala Ala Arg Ala
100 105 110
Gly Thr Arg Ser Ser Arg Ala Arg Ala Thr Asp Ala Arg Gly Cys Arg
115 120 125
Leu Arg Ser Gln Leu Val Pro Val Ser Ala Leu Gly Leu Gly His Ser
130 135 140
Ser Asp Glu Leu Ile Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg
145 150 155 160
Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly
165 170 175
Ala Leu Arg Ser Pro Pro Gly Ser Arg Pro Ile Ser Gln Pro Cys Cys
180 185 190
Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr

```
        195                 200                 205
Trp Arg Thr Val Asp His Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
    210                 215                 220

<210> 35
<211> 112
<212> PRT
<213> Homo sapiens

<400> 35
Gly Gly Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg
 1               5                  10                  15
Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg
            20                  25                  30
Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg
        35                  40                  45
Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly
    50                  55                  60
Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys
65                  70                  75                  80
Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr
                85                  90                  95
Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
            100                 105                 110

<210> 36
<211> 111
<212> PRT
<213> Homo sapiens

<400> 36
Gly Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu
 1               5                  10                  15
Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser
            20                  25                  30
Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala
        35                  40                  45
Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala
    50                  55                  60
Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg
65                  70                  75                  80
Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp
                85                  90                  95
Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
            100                 105                 110

<210> 37
<211> 110
<212> PRT
<213> Homo sapiens

<400> 37
Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg
 1               5                  10                  15
Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp
            20                  25                  30
Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg
```

```
        35                  40                  45
Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu
    50                  55                  60
Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro
65                  70                  75                  80
Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg
                85                  90                  95
Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
            100                 105                 110
```

<210> 38
<211> 109
<212> PRT
<213> Homo sapiens

<400> 38

```
Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser
 1               5                  10                  15
Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu
            20                  25                  30
Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser
        35                  40                  45
Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg
    50                  55                  60
Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr
65                  70                  75                  80
Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr
                85                  90                  95
Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
            100                 105
```

<210> 39
<211> 108
<212> PRT
<213> Homo sapiens

<400> 39

```
Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln
 1               5                  10                  15
Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu
            20                  25                  30
Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro
        35                  40                  45
His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro
    50                  55                  60
Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg
65                  70                  75                  80
Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val
                85                  90                  95
Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
            100                 105
```

<210> 40
<211> 107
<212> PRT
<213> Homo sapiens

<400> 40
Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu
 1   5   10   15
Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val
            20   25   30
Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His
        35   40   45
Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro
    50   55   60
Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr
65   70   75   80
Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp
                85   90   95
Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
            100   105

<210> 41
<211> 106
<212> PRT
<213> Homo sapiens

<400> 41
Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val
 1   5   10   15
Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg
            20   25   30
Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp
        35   40   45
Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro
    50   55   60
Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu
65   70   75   80
Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg
                85   90   95
Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
            100   105

<210> 42
<211> 105
<212> PRT
<213> Homo sapiens

<400> 42
Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro
 1   5   10   15
Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe
            20   25   30
Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu
        35   40   45
Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly
    50   55   60
Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala
65   70   75   80
Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu
                85   90   95
Ser Ala Thr Ala Cys Gly Cys Leu Gly
            100   105

<210> 43
<211> 104
<212> PRT
<213> Homo sapiens

<400> 43
Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val
 1   5   10   15
Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg
            20   25   30
Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser
        35   40   45
Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser
    50   55   60
Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val
65   70   75   80
Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser
                85   90   95
Ala Thr Ala Cys Gly Cys Leu Gly
            100

<210> 44
<211> 103
<212> PRT
<213> Homo sapiens

<400> 44
Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg
 1   5   10   15
Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe
            20   25   30
Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu
        35   40   45
Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg
    50   55   60
Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser
65   70   75   80
Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala
                85   90   95
Thr Ala Cys Gly Cys Leu Gly
            100

<210> 45
<211> 102
<212> PRT
<213> Homo sapiens

<400> 45
Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala
 1   5   10   15
Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys
            20   25   30
Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala
        35   40   45
Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro
    50   55   60

```
Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe
65                  70                  75                  80
Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr
                85                  90                  95
Ala Cys Gly Cys Leu Gly
            100

<210> 46
<211> 101
<212> PRT
<213> Homo sapiens

<400> 46
Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu
 1               5                  10                  15
Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser
            20                  25                  30
Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser
        35                  40                  45
Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val
    50                  55                  60
Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met
65                  70                  75                  80
Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala
                85                  90                  95
Cys Gly Cys Leu Gly
            100

<210> 47
<211> 100
<212> PRT
<213> Homo sapiens

<400> 47
Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly
 1               5                  10                  15
Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly
            20                  25                  30
Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu
        35                  40                  45
Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser
    50                  55                  60
Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp
65                  70                  75                  80
Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys
                85                  90                  95
Gly Cys Leu Gly
            100

<210> 48
<211> 99
<212> PRT
<213> Homo sapiens

<400> 48
Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu
 1               5                  10                  15
```

```
Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser
            20                  25                  30
Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu
        35                  40                  45
Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln
    50                  55                  60
Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val
65                  70                  75                  80
Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly
                85                  90                  95
Cys Leu Gly
```

<210> 49
<211> 197
<212> PRT
<213> Homo sapiens

<400> 49

```
Met Gln Arg Trp Lys Ala Ala Ala Leu Ala Ser Val Leu Cys Ser Ser
 1               5                  10                  15
Val Leu Ser Ile Trp Met Cys Arg Glu Gly Leu Leu Leu Ser His Arg
            20                  25                  30
Leu Gly Pro Ala Leu Val Pro Leu His Arg Leu Pro Arg Thr Leu Asp
        35                  40                  45
Ala Arg Ile Ala Arg Leu Ala Gln Tyr Arg Ala Leu Leu Gln Gly Ala
    50                  55                  60
Pro Asp Ala Met Glu Leu Arg Glu Leu Thr Pro Trp Ala Gly Arg Pro
65                  70                  75                  80
Pro Gly Pro Arg Arg Arg Ala Gly Pro Arg Arg Arg Arg Ala Arg Ala
                85                  90                  95
Arg Leu Gly Ala Arg Pro Cys Gly Leu Arg Glu Leu Glu Val Arg Val
            100                 105                 110
Ser Glu Leu Gly Leu Gly Tyr Ala Ser Asp Glu Thr Val Leu Phe Arg
        115                 120                 125
Tyr Cys Ala Gly Ala Cys Glu Ala Ala Ala Arg Val Tyr Asp Leu Gly
    130                 135                 140
Leu Arg Arg Leu Arg Gln Arg Arg Arg Leu Arg Arg Glu Arg Val Arg
145                 150                 155                 160
Ala Gln Pro Cys Cys Arg Pro Thr Ala Tyr Glu Asp Glu Val Ser Phe
                165                 170                 175
Leu Asp Ala His Ser Arg Tyr His Thr Val His Glu Leu Ser Ala Arg
            180                 185                 190
Glu Cys Ala Cys Val
        195
```

<210> 50
<211> 156
<212> PRT
<213> Homo sapiens

<400> 50

```
Met Ala Val Gly Lys Phe Leu Leu Gly Ser Leu Leu Leu Leu Ser Leu
 1               5                  10                  15
Gln Leu Gly Gln Gly Trp Gly Pro Asp Ala Arg Gly Val Pro Val Ala
            20                  25                  30
Asp Gly Glu Phe Ser Ser Glu Gln Val Ala Lys Ala Gly Gly Thr Trp
        35                  40                  45
```

```
Leu Gly Thr His Arg Pro Leu Ala Arg Leu Arg Arg Ala Leu Ser Gly
    50                  55                  60
Pro Cys Gln Leu Trp Ser Leu Thr Leu Ser Val Ala Glu Leu Gly Leu
65                  70                  75                  80
Gly Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala Gly Ser
                85                  90                  95
Cys Pro Arg Gly Ala Arg Thr Gln His Gly Leu Ala Leu Ala Arg Leu
            100                 105                 110
Gln Gly Gln Gly Arg Ala His Gly Gly Pro Cys Cys Arg Pro Thr Arg
        115                 120                 125
Tyr Thr Asp Val Ala Phe Leu Asp Asp Arg His Arg Trp Gln Arg Leu
    130                 135                 140
Pro Gln Leu Ser Ala Ala Ala Cys Gly Cys Gly Gly
145                 150                 155

<210> 51
<211> 211
<212> PRT
<213> Homo sapiens

<400> 51
Met Lys Leu Trp Asp Val Val Ala Val Cys Leu Val Leu Leu His Thr
 1               5                  10                  15
Ala Ser Ala Phe Pro Leu Pro Ala Gly Lys Arg Pro Pro Glu Ala Pro
            20                  25                  30
Ala Glu Asp Arg Ser Leu Gly Arg Arg Arg Ala Pro Phe Ala Leu Ser
        35                  40                  45
Ser Asp Ser Asn Met Pro Glu Asp Tyr Pro Asp Gln Phe Asp Asp Val
    50                  55                  60
Met Asp Phe Ile Gln Ala Thr Ile Lys Arg Leu Lys Arg Ser Pro Asp
65                  70                  75                  80
Lys Gln Met Ala Val Leu Pro Arg Arg Glu Arg Asn Arg Gln Ala Ala
                85                  90                  95
Ala Ala Asn Pro Glu Asn Ser Arg Gly Lys Gly Arg Arg Gly Gln Arg
            100                 105                 110
Gly Lys Asn Arg Gly Cys Val Leu Thr Ala Ile His Leu Asn Val Thr
        115                 120                 125
Asp Leu Gly Leu Gly Tyr Glu Thr Lys Glu Glu Leu Ile Phe Arg Tyr
    130                 135                 140
Cys Ser Gly Ser Cys Asp Ala Ala Glu Thr Thr Tyr Asp Lys Ile Leu
145                 150                 155                 160
Lys Asn Leu Ser Arg Asn Arg Arg Leu Val Ser Asp Lys Val Gly Gln
                165                 170                 175
Ala Cys Cys Arg Pro Ile Ala Phe Asp Asp Asp Leu Ser Phe Leu Asp
            180                 185                 190
Asp Asn Leu Val Tyr His Ile Leu Arg Lys His Ser Ala Lys Arg Cys
        195                 200                 205
Gly Cys Ile
    210

<210> 52
<211> 365
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
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<222> (5)...(346)

<400> 52
tacc atg gct gga gga ccg gga tct cgt gct cgt gca gca gga gca cgt 49
Met Ala Gly Gly Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg
1 5 10 15

ggc tgt cgt ctg cgt tct caa cta gtg ccg gtg cgt gca ctc gga ctg 97
Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu
20 25 30

gga cac cgt tcc gac gaa cta gta cgt ttt cgt ttt tgt tca gga tct 145
Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser
35 40 45

tgt cgt cgt gca cgt tct ccg cat gat cta tct cta gca tct cta cta 193
Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu
50 55 60

gga gcc gga gca cta aga ccg ccg ccg gga tct aga cct gta tct caa 241
Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln
65 70 75

cct tgt tgt aga cct act aga tac gaa gca gta tct ttc atg gac gta 289
Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val
80 85 90 95

aac tct aca tgg aga acc gta gat aga cta tct gca acc gca tgt ggc 337
Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly
100 105 110

tgt cta gga tgataatagg gatccggct 365
Cys Leu Gly

<210> 53
<211> 365
<212> DNA
<213> Homo sapiens

<400> 53
agccggatcc ctattatcat cctagacagc cacatgcggt tgcagatagt ctatctacgg 60
ttctccatgt agagtttacg tccatgaaag atactgcttc gtatctagta ggtctacaac 120
aaggttgaga tacaggtcta gatcccggcg gcggtcttag tgctccggct cctagtagag 180
atgctagaga tagatcatgc ggagaacgtg cacgacgaca agatcctgaa caaaaacgaa 240
aacgtactag ttcgtcggaa cggtgtccca gtccgagtgc acgcaccggc actagttgag 300
aacgcagacg acagccacgt gctcctgctg cacgagcacg agatcccggt cctccagcca 360
tggta 365

<210> 54
<211> 114
<212> PRT
<213> Homo sapiens

<400> 54
Met Ala Gly Gly Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly
1 5 10 15
Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly

```
            20                  25                  30
His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys
        35                  40                  45
Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly
    50                  55                  60
Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro
65                  70                  75                  80
Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn
                85                  90                  95
Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys
            100                 105                 110
Leu Gly
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<210> 55
<211> 442
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (5)...(409)

<400> 55

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tacc atg ggc cat cat cat cat cat cat cat cat cat cac tcg agc ggc      49
     Met Gly His His His His His His His His His His Ser Ser Gly
      1               5                  10                  15

cat atc gac gac gac gac aag gct gga gga ccg gga tct cgt gct cgt       97
His Ile Asp Asp Asp Asp Lys Ala Gly Gly Pro Gly Ser Arg Ala Arg
                 20                  25                  30

gca gca gga gca cgt ggc tgt cgt ctg cgt tct caa cta gtg ccg gtg      145
Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val
            35                  40                  45

cgt gca ctc gga ctg gga cac cgt tcc gac gaa cta gta cgt ttt cgt      193
Arg Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg
        50                  55                  60

ttt tgt tca gga tct tgt cgt cgt gca cgt tct ccg cat gat cta tct      241
Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser
    65                  70                  75

cta gca tct cta cta gga gcc gga gca cta aga ccg ccg ccg gga tct      289
Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser
80                  85                  90                  95

aga cct gta tct caa cct tgt tgt aga cct act aga tac gaa gca gta      337
Arg Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val
                100                 105                 110

tct ttc atg gac gta aac tct aca tgg aga acc gta gat aga cta tct      385
Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser
            115                 120                 125

gca acc gca tgt ggc tgt cta gga tgataatagg gatccggctg ctaacaaagc     439
Ala Thr Ala Cys Gly Cys Leu Gly
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130 135

ccg 442

<210> 56
<211> 442
<212> DNA
<213> Homo sapiens

<400> 56
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tagtctatct acggttctcc atgtagagtt tacgtccatg aaagatactg cttcgtatct 120
agtaggtcta caacaaggtt gagatacagg tctagatccc ggcggcggtc ttagtgctcc 180
ggctcctagt agagatgcta gagatagatc atgcggagaa cgtgcacgac gacaagatcc 240
tgaacaaaaa cgaaaacgta ctagttcgtc ggaacggtgt cccagtccga gtgcacgcac 300
cggcactagt tgagaacgca gacgacagcc acgtgctcct gctgcacgag cacgagatcc 360
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atgatgatga tggcccatgg ta 442

<210> 57
<211> 135
<212> PRT
<213> Homo sapiens

<400> 57
Met Gly His His His His His His His His His His Ser Ser Gly His
1 5 10 15
Ile Asp Asp Asp Asp Lys Ala Gly Gly Pro Gly Ser Arg Ala Arg Ala
20 25 30
Ala Gly Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg
35 40 45
Ala Leu Gly Leu Gly His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe
50 55 60
Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu
65 70 75 80
Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg
85 90 95
Pro Val Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser
100 105 110
Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala
115 120 125
Thr Ala Cys Gly Cys Leu Gly
130 135

<210> 58
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 58
gctggcccgg ctgcaggg 18

<210> 59
<211> 20

<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 59
taggccacgt cggtgtagcg 20

<210> 60
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 60
gctgcgacga ctgcgcca 18

<210> 61
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 61
aaggacacct cgtcctcgta ggc 23

<210> 62
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 62
attgaaaaac ttatccag 18

<210> 63
<211> 23
<212> DNA
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<220>
<223> primer

<400> 63
aacgacaggt catcatcaaa ggc 23

<210> 64
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 64
Asn Glu Gln Lys
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<210> 65
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 65
Asn His Gln Lys
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<210> 66
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 66
Asn Asp Glu Gln
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<210> 67
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 67
Gln His Arg Lys
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<210> 68
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 68
Met Ile Leu Val
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<210> 69

<211> 4
<212> PRT
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<220>
<223> exemplary motif

<400> 69
Met Ile Leu Phe
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<210> 70
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 70
Ser Thr Asn Lys
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<210> 71
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 71
Ser Thr Pro Ala
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<210> 72
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 72
Ser Gly Asn Asp
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<210> 73
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 73
Ser Asn Asp Glu Gln Lys

1 5

<210> 74
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 74
Asn Asp Glu Gln His Lys
1 5

<210> 75
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> exemplary motif

<400> 75
Asn Glu Gln His Arg Lys
1 5

<210> 76
<211> 86
<212> PRT
<213> Artificial Sequence

<220>
<223> consensus sequence

<221> VARIANT
<222> 5-12, 21-51, 53, 58-79, 82, 83
<223> Xaa = any amino acid

<221> VARIANT
<222> 15
<223> Xaa = Tyr or Phe

<400> 76
Leu Gly Leu Gly Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Phe Arg Xaa Cys
1 5 10 15
Ser Gly Ser Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
20 25 30
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
35 40 45
Xaa Xaa Xaa Gln Xaa Cys Cys Arg Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa
50 55 60
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Ser
65 70 75 80
Ala Xaa Xaa Cys Gly Cys
85